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IS : 4303 (Part I) - 1975

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Indian Standard

CODE OF HYGIENIC CONDITIONS FOR FISH INDUSTRY

PART I PRE-PROCESSING STAGE

(First Revision)

UDC 664·95 : 613·6

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INDIAN STANDARDS INSTITUTION
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CODE OF HYGIENIC CONDITIONS FOR FISH INDUSTRY

PART I PRE-PROCESSING STAGE

(First Revision)

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AMENDMENT NO. 1 DECEMBER 1983

TO

IS:4303(Part 1)-1975 CODE OF HYGIENIC CONDITIONS FOR FISH INDUSTRY

PART 1 PRE-PROCESSING STAGE

(First Revision)

Alterations

(*Page 12, clause 7.1, lines 6 and 7*) - Delete the following:

'urine; and blood examination for venereal diseases.'

(*Page 13, clause 7.3*) - Substitute the following for the existing clause:

'7.3 All employees shall be inoculated against typhoid and paratyphoid A diseases on their first appointment and thereafter once in every five years. In case of epidemics, all workers shall be inoculated. A record shall be maintained.'

(AFDC 36)

Reprography Unit, ISI, New Delhi, India

Indian Standard

CODE OF HYGIENIC CONDITIONS FOR FISH INDUSTRY

PART I PRE-PROCESSING STAGE

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part I) (First Revision) was adopted by the Indian Standards Institution on 30 September 1975, after the draft finalized by the Food Hygiene, Sampling and Analysis Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 In order to ensure that fish and fisheries products reach the consumer in as fresh and clean a state as possible, it is necessary to maintain certain conditions which will prevent the product from incidental contamination due to unhygienic conditions, improper handling, etc. This code has been formulated to assist the industry in supplying safe, sound and wholesome fish and fisheries products to the consumer. The code prescribes the broad principles which when followed would help in achieving the aforesaid objectives.

0.3 This standard was first published in 1967. This revision incorporates definitions, details of handling fish at sea, unloading and employee hygiene. Besides, other provisions have been updated in the light of the latest developments in the field.

0.4 This code is an adjunct to IS : 2491-1972* and it covers requirements specific to the fish industry.

0.5 This code is subject to the provisions in the Factories Act, 1948, and the Prevention of Food Adulteration Act, 1954, and the Rules framed thereunder.

0.6 In the preparation of this standard considerable assistance has been derived from the work of the Codex Committee on Fish and Fisheries Products.

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*Code for hygienic conditions for food processing units (*first revision*).

1. SCOPE

1.1 This standard (Part I) prescribes the hygienic requirements for fish holds, handling of fish on board and transport of fish from fishing vessel to the processing site.

2. TERMINOLOGY

2.0 For the purpose of this standard the following definitions shall apply.

2.1 Boxed Stowage — The stowage of fish on board of the vessel in boxes.

2.2 Bulk Stowage — The mass stowage of fish in pounds on board the vessel (*see* **2.8**).

2.3 Chilling — The process of cooling fish to a temperature approaching that of melting ice.

2.4 Fillet — A slice of fish of irregular size and shape removed from the carcass by cuts made to the backbone.

2.5 Fish — Any of the cold-blooded aquatic vertebrate animals, *Pisces, Elasmobracks* and *Crustacea* (*see* IS : 7313-1974*).

2.6 Fresh Fish — Freshly caught fish which have received no preserving treatment, or which have been preserved only by chilling.

2.7 Gutted Fish — Fish from which the guts have been removed.

2.8 Pounds or Pens — Areas in the fish hold and on deck, divided off by stanchions and portable board structures for the storage of fish.

2.9 Shelf Stowage — The stowage of fish in single layers, on shelves on board of the vessel.

3. HANDLING OF FRESH FISH AT SEA

3.1 Fishing Vessel Facilities and Operating Requirements

3.1.1 *General Considerations*

3.1.1.1 Fishing vessels should be designed for the rapid and efficient handling of fish, ease of cleaning and sanitization, and should be of such material and construction as not to cause any damage or contamination to the catch.

3.1.1.2 Fishing vessels should be so designed and constructed as not to cause contamination of the fish with bilge, sewage, smoke, fuel, oil, grease or other objectionable substances. Fish should be protected against physical damage, exposure to high temperatures and drying effects of sun and wind.

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*Glossary of important fish species of India.

3.1.1.3 All surfaces with which the fish might come in contact should be made of suitable non-corrosive material which should be smooth and easily cleanable.

NOTE — If the vessel is large enough to engage in the processing of fish, then its design, layout, construction and equipment should meet the requirements of shore establishments and the processing should be carried out under similar hygienic and sanitary conditions.

3.1.1.4 Deck pound or pen stanchions and dividing boards should be constructed of suitable non-corrosive material. They should be adequate in number and height to prevent movement of the fish, due to the vessel's motion.

3.1.1.5 Deck pound or pen dividing boards should be fitted to allow for easy removal, and should have hand grips. Boards should have gates fitted, as required, and drain notches cut in the lower edges.

3.1.1.6 Fish holds should be adequately insulated with a suitable material. Any pipes, chains or conduits passing through the hold should, if possible, be sunk flush or neatly boxed in and insulated.

3.1.1.7 Fish hold linings should be completely water-tight. Care should be taken to prevent water from carrying fish slime, blood, scales and offal to parts of the vessel where effective cleaning is virtually impossible. The insulation layer should be protected by the fish hold lining made of non-corrosive metal sheets or any other equally suitable material having water-tight joints.

3.1.1.8 Stanchions should be located in the fish hold so that the base dimensions of each pound or pen do not exceed 1·4 × 1·4 m.

3.1.1.9 Portable boards of suitable non-corrosive material or impregnated and painted wood should be used for making shelves and vertical divisions in the fish room.

3.1.1.10 Shelving boards should be designed to allow adequate drainage.

3.1.1.11 The shelves should be installed so that the maximum depth of fish, when bulk stowing, does not exceed 1 m.

3.1.1.12 There should always be ample drainage space between the lowest shelves and the floor of the fish hold. This space should be open to a central drain, discharging directly into one or more sumps or wells, located so that the hold can be efficiently drained at all times. Bilge pump connections to these sumps should be fitted with coarse screen filters.

3.1.1.13 Where boxing at sea is carried out, the stanchion and dividing structure should be designed to accommodate boxes of fish without leaving large air gaps.

3.1.1.14 When cooling grids are fitted in the fish hold they should be properly installed and operated.

3.1.1.15 Except for tank stowage in refrigerated sea water or refrigerated brine, the stowage of fish for human consumption in holds that are not divided into pounds is not recommended. The holds of small vessels carrying such fish as herring should be fitted with at least one longitudinal and one athwartship bulkhead, which may be removed if the vessel is converted for other types of fishing. Such bulkheads should be constructed of smooth, non-absorbent, easily cleanable material.

3.1.1.16 Holds that are not divided into pounds or pens should have an adequate number of drain lines located at intervals along the hold, discharging to a central drain or bilge. Vertical drain slots should be located along both the forward and apt bulkheads, running from deckhead to bilge.

3.1.1.17 There should be no sharp corners or projections in the hold, as these may make cleaning difficult and may damage the fish.

3.1.1.18 Refrigerated clean sea-water or refrigerated brine may also be considered for some fisheries.

3.1.1.19 Refrigerated sea-water or refrigerated brine systems should be properly designed to give adequate cooling capacity.

3.1.1.20 In all ships using refrigerated sea-water or refrigerated brine systems for preservation of the catch, tanks, heat exchanges, pumps and associated piping should be made of, or coated with, suitable non-corrosive material. They should be designed so that they can easily be cleaned and sanitized.

3.2 Sanitary Facilities

3.2.1 Areas of the deck where fish are unloaded and handled, or the fish hold where fish are stowed should be used exclusively for those purposes.

3.2.2 An ample supply of cold potable water or cold clean sea-water under adequate pressure should be available at a number of points throughout the fishing vessel. With large vessels engaged in fish processing, a supply of hot water at a minimum temperature of 82°C should also be available.

3.2.3 A system for injecting chlorine into the lines of sea-water which may be used in the processing of fish or for the clean-up of the vessel should be provided.

3.2.4 Deck hoses should be supplied with clean sea-water, at adequate pressure, by a pump used only for clean sea-water.

3.2.5 Ice used in every fishery should be made from potable water or clean sea-water and should not be contaminated when manufactured, handled or stored.

3.2.6 The use of clean sea-water ice is not generally recommended.

3.2.7 The vessel's toilet facilities and all plumbing and waste-disposal lines should be so constructed as not to contaminate the fish.

3.2.8 Where the bait is carried, it should be held in such a manner that it does not contaminate the catch.

3.2.9 On large fishing vessels, engaged in fishing as well as fish processing, suitable hand washing facilities should be provided.

3.3 Equipment and Utensils

3.3.1 All fish handling, conveying and storage equipment, used on board of fishing vessels, should be designed for the rapid and efficient handling of fish. These should be suitable for easy cleaning and should be so constructed as not to cause contamination of the catch.

3.3.2 Fish washing and conveying equipment should be constructed of suitable non-corrosive material and be fitted with chutes or similar means of conveying fish into the hold. Chutes should be of sufficient length and fitted in such a manner that fish do not have to be dropped more than 1 m into the hold.

3.3.3 Conveyors used in the fish hold should be made of non-corrosive material and should be easy to dismantle and remove for cleaning purposes.

3.3.4 All tubs, tanks, barrels and other containers used for handling and conveying of fish should be of non-corrosive material and easy to clean.

3.3.5 Where sizable quantities of fish are handled on board of large fishing vessels, the use of machinery designed to carry out gutting and cleaning should be considered.

3.3.6 All boxes used for ice stowing of fish should be of uniform and proper size, easy to handle when loaded, and should be constructed of suitable non-corrosive material.

3.3.7 The fishing vessels should be equipped with brushes, scrapers, water hoses, spray nozzles and other suitable washing and sanitizing equipment.

3.4 Hygienic Operating Requirements

3.4.1 Before any fish is brought aboard, and between each haul of the gear, decks, boards, stanchions and all other deck equipment which may come in contact with fish should be hosed down with clean sea-water and brushed to remove all visible dirt, slime and blood.

3.4.2 All tubs, tanks, barrels and other equipment used in the handling, gutting, washing and conveying operations should be thoroughly cleaned after such cycle of operations.

3.4.3 During fishing trips the fish hold bilge sump should be drained regularly. The sump should be accessible at all times.

3.4.4 Cod ends and other parts of the fishing gear which come in contact with fish should be freed of dead fish and organic material after each haul. All gear should be thoroughly cleaned after fishing operations.

3.4.5 Sea-water which has been used for cooling engines, condensers or similar equipment should not be used for washing fish, deck, hold or any equipment coming in contact with fish.

3.4.6 When cleaning and hosing operations are carried out while the vessel is in port, potable fresh or clean sea-water should be used.

3.4.7 Immediately after the catch is unloaded, the deck and all deck equipment should be hosed down, brushed, thoroughly cleaned with a suitable cleaning agent, and sanitized.

3.4.8 Immediately after the catch is unloaded, the fish hold and bilge sump should also be emptied completely. All surfaces in the hold, pound boards and sump should be thoroughly cleaned with a suitable cleaning agent, and sanitized.

3.4.9 In ships using refrigerated sea-water or refrigerated brine systems for the preservation of the catch, all tanks, pumps, heat exchangers and other associated equipment should be cleaned immediately after discharging the catch. Potable water containing a suitable cleaning agent should be circulated through all parts of the system. Tanks should be inspected carefully and cleaned out by brushing, if necessary.

3.4.10 Where refrigerated sea-water is used for the preservation of fish, only clean sea-water should be used and should be changed as often as possible to prevent the accumulation of contaminating materials.

3.4.11 Adequate precautions should be taken to ensure that the human and other wastes from the fishing vessel are disposed of in such a manner as not to constitute a public health hazard.

3.4.12 Effective measures should be taken to protect the fishing vessel against insects, rodents, birds or other vermin.

3.4.13 Dogs, cats and other domestic animals should be excluded from areas of the vessel where fish is received, handled, processed and stored.

3.4.14 After catching species, such as herring for reduction purposes, when a vessel is converted for storing fish in ice for human consumption, the hold shall be thoroughly cleaned, and sanitized.

3.5 Handling the Catch on Board

3.5.1 Duration of the fishing trip for a fishing vessel should be determined by the facilities available on the vessel for handling and keeping the catch well-chilled, distance from the processing plant and the local environmental conditions.

3.5.2 Handling of the catch should begin as soon as it comes on board.

3.5.3 Where it is required to keep species of fish unsuitable for human consumption, these should always be sorted from the edible catch and kept separate at all times.

3.5.4 Fish should not be trampled or stood upon, and should not be piled deeply on deck.

3.5.5 All fish on deck should be protected from sun, frost, and the drying effects of wind.

3.5.6 Line-caught fish should, wherever practicable, be stunned as soon as they are taken on board the vessel.

3.5.7 Bleeding of the fish, when necessary, should be done immediately after the fish is landed.

3.5.8 Gutting of the fish should commence immediately on arrival of the catch on the deck.

3.5.9 Where rapid gutting is not practicable, whole fish should be washed and chilled as soon as it arrives on deck.

3.5.10 As it is impracticable to gut very small fish, these should be placed in iced and chilled storage quickly.

3.5.11 Gutting should be complete and carried out with care.

3.5.12 Fish guts should not be allowed to contaminate other fish on deck.

3.5.13 Separate and adequate storage facilities should be provided for the fish roe, milt and livers if these are required to be saved for utilization later.

3.5.14 Immediately after gutting, fish should be washed with cold clean sea-water and further handling should be carried out without delay.

3.5.15 Deck hatches should not be left open longer than necessary to load the fish which should be allowed to slide down the chutes into the hold or be lowered in suitable containers.

3.5.16 Fish should be chilled rapidly in melting ice and should be stored so that the temperature does not rise. For short term storage, refrigerated sea-water or refrigerated brine may be used.

3.5.17 Fish in ice should be stowed in shallow layers.

3.5.18 The practice of shelf stowage is not recommended, unless the single layers of fish are completely covered with layers of ice.

3.5.19 Fish should be surrounded by adequate quantities of ice.

3.5.20 Ice should also be used to prevent contact with all surfaces in the fish hold.

3.5.21 Crushed ice should always be used to give close contact with the fish.

3.5.22 Fish should not be packed in refrigerated sea-water or refrigerated brine to a density of more than 800 kg/m^3.

3.6 Unloading the Catch

3.6.1 The catch should be unloaded carefully without little delay.

3.6.2 At the conclusion of each fishing trip, all unused ice should be removed from the fishroom before cleaning.

3.6.3 The catch of different days should not be mixed.

3.6.4 Mechanical unloading equipment should be used where possible and care should be taken to avoid damage during unloading.

3.6.5 The catch should be unloaded into clean containers and immediately placed in a suitable covered area. While laying in this area the catch should be maintained in a chilled condition.

3.6.6 Care should be taken that fish are not damaged or contaminated during sorting, weighing and transfer to containers.

3.6.7 In case the unloading of refrigerated brine or sea-water boats is carried out by means of pumps and syphons the compensating or ' Make-up ' water should be of the same temperature and quality as the original brine.

4. CARE AFTER UNLOADING

4.1 Care shall be taken to avoid any damage or injury to fish.

4.2 The fish shall not be exposed to the sun or rain.

4.3 Fish de-iced for weighing shall be re-iced or chilled below 2°C within one hour from unloading.

5. TRANSPORT FROM THE UNLOADING SITE TO THE PROCESSING UNIT

5.1 Fresh Fish

5.1.1 Fresh fish, which has been chilled, shall not be transported or accepted for transport when the internal product temperature exceeds 2°C,

5.1.2 Containers used for the transport of fresh fish shall not be filled to an extent as to cause damage to the fish when containers are placed one above the other.

5.2 Frozen Fish — Frozen fish shall be continuously maintained at a temperature of −18°C or below during transport except for short intervals during loading and unloading when the temperature of the fish shall not exceed −12°C and the fish shall be cooled to −18°C as quickly as possible.

5.3 Other General Provisions

5.3.1 All vehicles and containers used in the transport of fish shall be so constructed as to be easily cleanable. Materials used for lining shall be of metal or other material impervious to water. The floor of the vehicle shall be constructed of durable material impervious to water. All corners shall be rounded to facilitate cleaning.

5.3.2 Before and after the transport of fresh fish, fish containers and the carrying compartment of vehicles shall be washed, and the floors of vehicles scrubbed with cold water and a suitable detergent and then rinsed with clean fresh water.

5.3.3 All equipment, receptacles and containers coming in contact with fish shall be washed and scrubbed daily with clean water and a suitable detergent. After cleaning with detergents all surfaces of the carrying compartment of the vehicles and equipment shall be rinsed with clean fresh water.

5.3.4 Fresh or frozen fish for human consumption shall not be transported in containers or vehicles where spoilage or contamination is likely to occur from contact with other goods. Fish offal shall not be transported with fish meant for human consumption.

5.3.5 Before loading with fish, all interior surfaces of vehicles and containers shall be clean and shall be free from objectionable odours characteristics of spoiled fish.

5.3.6 Transport vehicles and containers shall be maintained in good condition and regular checks shall be made on the thermal efficiency of the insulated or refrigerated carrier.

5.3.7 Insulated container and vehicles equipped with refrigeration shall be pre-cooled to an air temperature of −7°C or below before commencement of loading.

5.3.8 Frozen fish shall be loaded in a refrigerated transport vehicle in a manner that provides for the free circulation of air at the top, bottom and sides of the load. A minimum air space of 75 mm from the top, 25 mm from the floor and 12·5 mm from each of the sides shall be provided.

5.3.9 After the loading or unloading operations, the mechanical refrigeration equipment shall be turned on and the doors of containers and vehicles shall be kept closed.

6. THE RECEIVING POINT

6.1 Immediately on receipt from a fishing boat or transport vehicle, fish to be processed or packed as fresh fish shall be chilled by packing in ice or by other suitable method so that the temperature does not exceed 2°C but is in no case lower than −2°C. Fish to be preserved or packed as quick frozen or deep frozen fish shall be processed immediately on unloading or chilled to a temperature not exceeding 2°C but in no case lower than −2°C.

6.2 Fish held before processing shall be placed in clean well-drained bins, boxes or containers.

6.3 Prior to processing, loose fish shall be kept in clean containers or on a clean smooth surface with a slope for suitable drainage.

6.4 All fish shall be adequately washed with clean water prior to processing and before packing.

7. EMPLOYEE HYGIENE

7.1 Every person employed for fish handling on the fishing vessels shall be medically examined by an authorized registered medical practitioner and the examination shall include X-Ray of the chest for tuberculosis. The examination shall also include examination of stool for protozoal and helminthic infestation for those parasites which are transmitted by ingestion, and for the presence of *Salmonella*, *Shigella* species and *Vibrio cholerae*; urine; and blood examination for veneral diseases. Subsequently, an employee shall be medically examined once in a year or more frequently, if necessary, to ensure that he is medically fit and free from communicable diseases. A record of such examination shall be maintained.

7.1.1 It shall be impressed on all employees that they should notify the medical officer or management, cases of fever, sore throat, of cough, vomiting, diarrhoea, typhoid, dysentery, boils, cuts and sores and ulcers (however small), discharging ears and notifiable diseases occurring in their own homes and families.

7.1.2 No worker who is suspected to be suffering from any of the disorders listed in **7.1.1** shall be permitted to work inside the unit unless found medically fit. The supervisor shall check the personal hygiene of the workers before the start of work and whenever they enter any processing room after any absence.

7.2 Employees shall keep their finger nails short and clean and wash their hands with soap or detergent and water before commencing work and after each absence, specially after using senitary conveniences. Towels used for drying hands should be clean. No worker shall allow his clothing and/or any part of his/her body other than his/her hand from elbow downward to come in contact with fish. He should adopt strict hygienic practices so as to avoid adding any pathogenic microbial contamination to the material.

7.3 All employees shall be inoculated and vaccinated against the enteric groups of diseases once every two years and against smallpox once every five years. In case of an epidemic, all workers shall be inoculated. A record shall be maintained.

7.4 No worker shall be allowed to work without proper clothing and footwear.

7.5 Employees shall be provided with clean uniforms (preferably white) or aprons or both, and clean washable caps, where necessary.

7.5.1 Separate room or place for changing the clothes shall be provided.

7.5.2 The uniforms shall not be worn outside the plant but put on just before starting the work and changed when leaving.

7.6 Eating, spitting, nose cleaning or the use of tobacco in any form or chewing betel leaves shall be prohibited within the manufacturing, packing and storage area of the unit. Notice to this effect shall be prominently displayed and enforced.

7.7 Sufficient and suitable sanitary conveniences shall be provided, maintained and kept clean in every fishing vessel. The conveniences shall be properly lighted. Separate conveniences shall be provided for each sex. No convenience shall open directly into any work room in the fishing vessel. The conveniences shall always be maintained clean and in good repairs. Sufficient number of wash-basins with adequate provision of nail brushes, soap and towels should be provided. The wash-basins shall be installed in or alongside the sanitary conveniences.

INDIAN STANDARDS

ON

FOOD HYGIENE

IS:

2491-1972	Code of hygienic conditions for food processing units (*first revision*)
4303 (Part I)-1975	Code for hygienic conditions in fish industry: Part I Pre-processing stage (*first revision*)
5059-1969	Code for hygienic conditions for large scale biscuit manufacturing units and bakery units
5404-1969	Code of practice for handling of food samples for microbiological analysis
5837-1970	Code for hygienic conditions for soft drinks manufacturing units
5839-1970	Code of hygienic conditions for manufacture, storage and sale of ice-creams
6540-1972	Code of hygienic conditions for manufacture and handling of ice for human consumption
6541-1972	Code of hygienic conditions for establishment and maintenance of mid-day school meal programme
6542-1972	Code for hygienic conditions for fruit and vegetable canning units
6968-1973	Code for hygienic conditions for *PAN* (betal leaf) stalls and vendors
6969-1973	Code of hygienic conditions for handling and sale of refrigerated drinking water
7003-1973	Code for hygienic conditions for sago (*SABOODANA*) manufacturing units
7005-1973	Code for hygienic conditions for production, processing, transportation and distribution of milk
7799-1975	Code for preservation of vitamins in foodstuffs
7802-1975	Code of hygienic conditions for sweatmeat shops

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'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMEDABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Kothi No. 90, Sector 18A	CHANDIGARH 160018	2 83 20
5-8-56/57 Nampally Station Road	HYDERABAD 500001	4 57 11
117/418 B Sarvodaya Nagar	KANPUR 208005	82 72
B.C.I. Bldg (Third Floor), Gandhi Maidan East	PATNA 800004	2 56 55

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